

Amendments to the Claims:

Please amend the claims according to the following listing of claims, which will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method of Method for categorizing in a video encoder a portion of a video frame, comprising:
 - using texture information in the portion to determine whether the portion comprises at most a predetermined amount of spatial information;
 - based on the determination, if the texture information indicates that the portion comprises at most the predetermined amount of spatial information, then categorizing the portion as nonpredictive and; and
 - based on the determination, if the texture information indicates that the portion does not comprise at most a predetermined amount of spatial information, then:
 - in response to the determination, performing motion estimation to generate motion information associated with the portion; and
 - using the motion information to determine whether the portion comprises at least a predetermined amount of predictive information.
2. (Original) The method of Claim 1, wherein the texture information comprises texture bits.
3. (Previously Presented) The method of Claim 1, further comprising calculating a variance value of the portion of the video frame to generate the texture information.
4. (Previously Presented) The method of Claim 3, wherein the predetermined amount of spatial information is an average variance value of at least one other video frame, the method further comprising:
 - comparing the calculated variance value of the portion of the video frame to the average variance value of the at least one other video frame; and

if the variance value of the portion is less than the average variance value of the at least one other video frame, categorizing the portion as nonpredictive.

5. (Previously Presented) The method of Claim 4, wherein the average variance value is a scaled average variance value of at least one other video frame.

6. – 11. (Canceled).

12. (Currently amended) A method of Method for selectively encoding in a video encoder a current macroblock using nonpredictive encoding or predictive encoding, comprising:

using texture information of the current macroblock to determine whether to nonpredictively encode the current macroblock; and

~~upon in response to~~ determining not to nonpredictively encode the current macroblock based on the texture information, selectively performing motion estimation to generate motion information and using the motion information of the current macroblock to determine whether to predictively encode the current macroblock.

13. (Original) The method of Claim 12, wherein using texture information of the current macroblock to determine whether to nonpredictively encode the current macroblock comprises:

determining a variance value of the current macroblock;

comparing the variance value of the current macroblock to a scaled variance value of a macroblock from at least one other video frame; and

if the variance value of the current macroblock is less than the scaled variance value of the macroblock from at least one other video frame, then determining to nonpredictively encode the current macroblock.

14. (Original) The method of Claim 13, wherein the scaled variance value of the macroblock from at least one other video frame is a scaled average variance.

15. (Previously presented) The method of Claim 12, wherein using motion information of the current macroblock to determine whether to predictively encode the current macroblock comprises:

determining pixel differences between the current macroblock and a macroblock from another video frame; and

if the pixel differences between the current macroblock and the macroblock from another video frame is less than a configurable threshold value, then determining to predictively encode the current macroblock.

16. (Previously Presented) The method of Claim 12, wherein using motion information of the current macroblock to determine whether to predictively encode the current macroblock comprises:

determining a sum of absolute distance values between the current macroblock and macroblocks from at least one other video frame; and

if the sum of absolute distance values is less than a scaled average minimum sum of absolute distance values of macroblocks from at least one other video frame, then determining predictively encode the current macroblock.

17. (Original) The method of Claim 16, wherein the scaled average minimum sum of absolute distance values is configurable.

18. (Currently amended) A method of Method for selectively reducing processing cycles of a video codec, comprising:

receiving a configuration signal; and

configuring at least one variable within a complexity control algorithm in accordance with the configuration signal,

wherein based on the complexity control algorithm, a processor executing the algorithm:

determines whether texture information of the portions indicates there is less than or equal to a predetermined amount of spatial information;

categorizes portions of a predictive video frame as nonpredictive portions ~~based on the determination when texture information of the portions indicates there is less than or equal to a predetermined amount of spatial information,~~
in response to the determination and categorization, selectively performs motion estimation to generate motion information associated with the portion;
uses the motion information to determine whether to categorize the portions as predictive portions if the texture information of the portions indicates there is not less than or equal to the predetermined amount of spatial information, and
configures ~~configuring~~ the at least one variable of the complexity control algorithm increases the number of portions in the predictive video frame characterized as nonpredictive portions based upon the texture information.

19. (Original) The method of Claim 18, wherein the configuration signal conveys image size information.

20. (Original) The method of Claim 18, wherein the configuration signal conveys transmission frame rate information.

21. (Original) The method of Claim 18, wherein the configuration signal conveys a user command.

22. (Original) The method of Claim 18, wherein the configuration signal conveys information regarding available hardware resources.

23. (Currently amended) ~~An apparatus~~ Apparatus for selectively reducing the processing cycles of a video codec, comprising:

a first complexity control element configured to use texture information of a current macroblock to determine whether to nonpredictively encode the current macroblock; and

a second complexity control element configured to, ~~upon~~ in response to determining not to nonpredictively encode the current macroblock based on the texture information, selectively perform motion estimation to determine motion information associated with the portion, and use the motion information of the current macroblock to determine whether to predictively encode the current macroblock.

24. (Currently amended) ~~An apparatus~~ Apparatus for selectively reducing processing cycles of a video codec, comprising:

a complexity control element configured to receive a configuration signal and to configure at least one variable within a complexity control algorithm in accordance with the configuration signal,

wherein based on executing the complexity control algorithm, a processor:
determines whether texture information of the portions indicates there is less than or equal to a predetermined amount of spatial information,

categorizes portions of a predictive video frame as nonpredictive portions based on the determination when texture information of the portions indicates there is less than or equal to a predetermined amount of spatial information,

in response to the determination, selectively performs motion estimation to generate motion information associated with the portion,

uses the motion information to determine whether to categorize the portions as predictive portions if the texture information of the portions indicates there is not less than or equal to the predetermined amount of spatial information, and

configures ~~configuring~~ the at least one variable of the complexity control algorithm increases the number of portions in the predictive video frame characterized as nonpredictive portions based upon the texture information.

25. (Currently amended) An apparatus ~~Apparatus~~ for categorizing a portion of a video frame, comprising:

at least one memory element; and

at least one processing element configured to execute a set of instructions stored in the at least one memory element, the set of instructions for:

using texture information in the portion to determine whether the portion comprises at most a predetermined amount of spatial information;

based on the determination, if the texture information indicates that the portion comprises at most the predetermined amount of spatial information, then categorizing the portion as nonpredictive;

based on the determination, if the texture information indicates that the portion does not comprise at most a predetermined amount of spatial information, then:

in response to the determination, selectively performing a motion estimation search to determine motion information associated with the portion;

using the motion information determined during the motion estimation search to determine whether the portion comprises at least a predetermined amount of predictive information;

if the motion information indicates that the portion comprises at least the predetermined amount of predictive information, then categorizing the portion as predictive; and

if the motion information indicates that the portion does not comprise at least the predetermined amount of predictive information, then categorizing the portion as nonpredictive.

26. (Currently amended) An apparatus ~~Apparatus~~ for selectively encoding a current macroblock using nonpredictive encoding or predictive encoding, comprising:

means for using texture information of the current macroblock to determine whether to nonpredictively encode the current macroblock;

means for selectively performing motion estimation to generate motion information of the current macroblock, wherein the means for selectively performing

motion estimation is configured to selectively perform the motion estimation for the current macroblock in response to the determination whether to nonpredictively encode the current macroblock; and

means for using the motion information of the current macroblock to determine whether to predictively encode the current macroblock upon determining not to nonpredictively encode the current macroblock based on the texture information.

27. (Currently amended) An apparatus ~~Apparatus~~ for selectively reducing processing cycles of a video codec, comprising:

means for receiving a configuration signal; and

means for configuring at least one variable within a complexity control algorithm in accordance with the configuration signal, ~~wherein ;~~

means for determining whether texture information of the portions indicates there is less than or equal to a predetermined amount of spatial information, and

means for performing the complexity control algorithm, which categorizes portions of a predictive video frame as nonpredictive portions based on the determination ~~when texture information of the portions indicates there is less than or equal to a predetermined amount of spatial information,~~

means for selectively performing motion estimation to generate motion information associated with the portion in response to the determination; and

means for using the ~~uses~~ motion information to determine whether to categorize the portions as predictive portions if the texture information of the portions indicates there is not less than or equal to the predetermined amount of spatial information, and configuring the at least one variable of the complexity control algorithm increases the number of portions in the predictive video frame characterized as nonpredictive portions based upon the texture information.

28. (Currently amended) An apparatus ~~Apparatus~~ for categorizing a portion of a video frame, comprising:

means for using texture information in the portion to determine whether the portion comprises at most a predetermined amount of spatial information;

means for categorizing the portion as nonpredictive if based on the determination that the texture information indicates that the portion comprises at most the predetermined amount of spatial information;

means for selectively performing motion estimation to generate motion information of the current macroblock, wherein the means for performing motion estimation is configured to perform the motion estimation for the current macroblock in response to the determination whether to nonpredictively encode the current macroblock;
and

means for using the motion information to determine whether the portion comprises at least a predetermined amount of predictive information if the texture information indicates that the portion does not comprise at most the predetermined amount of spatial information.

29. (Previously Presented) The apparatus of Claim 28, further comprising means for calculating a variance value of the portion of the video frame to generate the texture information.

30. (Previously Presented) The apparatus of Claim 29, wherein the predetermined amount of spatial information is an average variance value of at least one other video frame, the apparatus further comprising:

means for comparing the calculated variance value of the portion of the video frame to the average variance value of the at least one other video frame; and wherein
the categorizing means categorizes the portion as nonpredictive if the variance value of the portion is less than the average variance value of the at least one other video frame.

31. (Previously Presented) The method of Claim 6, further comprising determining, when the portion is categorized as predictive, whether to perform fractional-pixel motion estimation based on a quality metric associated with the portion.

32. (Previously Presented) The method of Claim 31, wherein the quality metric comprises a sum of absolute difference (SAD) between pixel values of the portion and pixel values of a portion of at least one other video frame, the method further comprising:
- comparing SAD to a threshold SAD value; and
 - performing fractional-pixel motion estimation when the SAD is less than the threshold SAD value; and
 - bypassing the fractional-pixel motion estimation when the SAD is greater than or equal to the threshold SAD value.
33. (Previously Presented) The method of Claim 18, wherein configuring at least one variable within a complexity control algorithm further comprises adjusting the predetermined amount of spatial information.
34. (Previously Presented) The method of Claim 18, wherein receiving a configuration signal comprises receive a configuration signal that originates from a network.
35. (Previously Presented) The apparatus of Claim 23, wherein the first complexity control element determines a variance value of the current macroblock, compares the variance value of the current macroblock to a scaled variance value of a macroblock from at least one other video frame, and determines to nonpredictively encode the current macroblock if the variance value of the current macroblock is less than the scaled variance value of the macroblock from at least one other video frame.
36. (Previously Presented) The apparatus of Claim 23, wherein the second complexity control element determines pixel differences between the current macroblock and a macroblock from another video frame and determines to predictively encode the current macroblock with fractional-pixel motion estimation if the pixel differences between the current macroblock and the macroblock from another video frame is less than a configurable threshold value.

37. (Previously Presented) The apparatus of Claim 23, wherein the second complexity control element determines a sum of absolute distance values between the current macroblock and macroblocks from at least one other video frame and determines to predictively encode the current macroblock with fractional-pixel motion estimation if the sum of absolute distance values is less than a scaled average minimum sum of absolute distance values of macroblocks from at least one other video frame

38. (Previously Presented) The apparatus of Claim 37, wherein the scaled average minimum sum of absolute distance values is configurable.

39. (Previously Presented) The apparatus of Claim 24, wherein the configuration signal conveys one of image size information, transmission frame rate information, a user command, and information regarding available hardware resources.

40. (Previously Presented) The apparatus of Claim 24, wherein configuring at least one variable within a complexity control algorithm further comprises adjusting the predetermined amount of spatial information.

41. (Previously Presented) The apparatus of Claim 24, wherein receiving a configuration signal comprises receive a configuration signal that originates from a network.

42. (Previously Presented) The apparatus of Claim 25, wherein the processing element:
calculates a variance value of the portion of the video frame to generate the texture information;
compares the calculated variance value of the portion of the video frame to an average variance value of at least one other video frame; and
if the variance value of the portion is less than the average variance value of the at least one other video frame, categorizes the portion as nonpredictive.

43. (Previously Presented) The apparatus of Claim 25, wherein motion information comprises pixel differences between the portion of the video frame and at least a portion of at least one other video frame.

44. (Previously Presented) The apparatus of Claim 25, wherein the processing element determines, when the portion is categorized as predictive, whether to perform fractional-pixel motion estimation based on a quality metric associated with the portion.

45. (Previously Presented) The apparatus of Claim 44, wherein the quality metric comprises a sum of absolute difference (SAD) between pixel values of the portion and pixel values of a portion of at least one other video frame, and the processing element:

compares SAD to a threshold SAD value; and
performs fractional-pixel motion estimation when the SAD is less than the threshold SAD value; and
bypasses the fractional-pixel motion estimation when the SAD is greater than or equal to the threshold SAD value.

46. (Currently amended) An apparatus for categorizing a portion of a video frame comprising a processing element configured to:

use texture information in the portion to determine whether the portion comprises at most a predetermined amount of spatial information; and

categorize the portion as nonpredictive if based on the determination that the texture information indicates that the portion comprises at most the predetermined amount of spatial information;

based on the determination, if the texture information indicates that the portion does not comprise at most a predetermined amount of spatial information, then:

in response to the determination, selectively performing a motion estimation search to determine motion information associated with the portion; and

use the motion information to determine whether the portion comprises at least a predetermined amount of predictive information.

47. (Previously Presented) The apparatus of Claim 46, wherein the processing element is further configured to calculate a variance value of the portion of the video frame to generate the texture information.

48. (Previously Presented) The apparatus of Claim 47, wherein the predetermined amount of spatial information is an average variance value of at least one other video frame and the processing element is further configured to:

compare the calculated variance value of the portion of the video frame to the average variance value of the at least one other video frame; and wherein

categorize the portion as nonpredictive if the variance value of the portion is less than the average variance value of the at least one other video frame.

49. (Previously Presented) An apparatus for categorizing a portion of a video frame, comprising:

means for determining whether the portion comprises at most a predetermined amount of spatial information based on texture information in the portion;

means for categorizing the portion as nonpredictive if based on the determination that the texture information indicates that the portion comprises at most the predetermined amount of spatial information;

means for selectively performing a motion estimation search to generate motion information associated with the portion if in response to the determination that the texture information indicates that the portion does not comprise at most a predetermined amount of spatial information;

means for determining whether the portion comprises at least a predetermined amount of predictive information based on the motion information determined during the motion estimation search;

wherein the categorizing means categorizes the portion as predictive if the motion information indicates that the portion comprises at least the predetermined amount of predictive information and categorizes the portion as nonpredictive if the motion information indicates that the portion does not comprise at least the predetermined amount of predictive information.

50. (Previously Presented) The apparatus of Claim 49, further comprising:

means for calculating a variance value of the portion of the video frame to generate the texture information; and

means for comparing the calculated variance value of the portion of the video frame to an average variance value of at least one other video frame; wherein

the categorizing means categorizes the portion as nonpredictive if the variance value of the portion is less than the average variance value of the at least one other video frame.

51. (Previously Presented) The apparatus of Claim 49, further comprising means for determining whether to perform fractional-pixel motion estimation when the portion is categorized as predictive based on a quality metric associated with the portion.

52. (Previously Presented) The apparatus of Claim 51, wherein the quality metric comprises a sum of absolute difference (SAD) between pixel values of the portion and pixel values of a portion of at least one other video frame, the method further comprising:

comparing SAD to a threshold SAD value; and

performing fractional-pixel motion estimation when the SAD is less than the threshold SAD value; and

bypassing the fractional-pixel motion estimation when the SAD is greater than or equal to the threshold SAD value.

53. (Currently amended) A processor-readable storage medium comprising instructions that when executed by a processor cause the processor to:

use texture information in a portion of a video frame to determine whether the portion comprises at most a predetermined amount of spatial information; and

categorize the portion as nonpredictive if based on the determination that the texture information indicates that the portion comprises at most the predetermined amount of spatial information:

based on the determination, if the texture information indicates that the portion does not comprise at most a predetermined amount of spatial information, then:

in response to the determination, selectively perform motion estimation to generate motion information associated with the portion, and

use the motion information to determine whether the portion comprises at least a predetermined amount of predictive information.

54. (Previously Presented) The processor-readable storage medium of Claim 53, further comprising instructions that when executed by the processor cause the processor to calculate a variance value of the portion of the video frame to generate the texture information.

55. (Previously Presented) The processor-readable storage medium of Claim 54, wherein the predetermined amount of spatial information is an average variance value of at least one other video frame, the processor-readable medium further comprising instructions that when executed by the processor cause the processor to:

compare the calculated variance value of the portion of the video frame to the average variance value of the at least one other video frame;

wherein instructions to categorize the portion of the video frame comprise instructions that cause the processor to categorize the portion as nonpredictive if the variance value of the portion is less than the average variance value of the at least one other video frame.

56. (Previously Presented) The processor-readable storage medium of Claim 53, further comprising instructions that when executed by the processor cause the processor to, upon determining not to nonpredictively encode the current macroblock based on the texture information, use motion information of the current macroblock to determine whether to predictively encode the current macroblock.

57. (Previously Presented) The processor-readable storage medium of Claim 56, further comprising instructions that when executed by the processor cause the processor to:

determine pixel differences between the current macroblock and a macroblock from another video frame; and

if the pixel differences between the current macroblock and the macroblock from another video frame is less than a configurable threshold value, then determine to predictively encode the current macroblock.

58. (Previously Presented) The processor-readable storage medium of Claim 56, further comprising instructions that when executed by the processor cause the processor to:

determine a sum of absolute distance values between the current macroblock and macroblocks from at least one other video frame; and

if the sum of absolute distance values is less than a scaled average minimum sum of absolute distance values of macroblocks from at least one other video frame, then determine predictively encode the current macroblock.

59. (Currently amended) A processor-readable storage medium ~~comprising~~ having stored thereon instructions that when executed by a processor cause the processor to:

use texture information in a portion of a video frame to determine whether the portion comprises at most a predetermined amount of spatial information;

categorize the portion as nonpredictive if the texture information indicates that the portion comprises at most the predetermined amount of spatial information;

based on the determination, if the texture information indicates that the portion does not comprise at most a predetermined amount of spatial information, then:

in response to the determination, selectively perform a motion estimation search to determine motion information associated with the portion;

use the motion information determined during the motion estimation search to determine whether the portion comprises at least a predetermined amount of predictive information;

if the motion information indicates that the portion comprises at least the predetermined amount of predictive information, then categorize the portion as predictive; and

if the motion information indicates that the portion does not comprise at least the predetermined amount of predictive information, then categorize the portion as nonpredictive.

60. (Previously Presented) The processor-readable storage medium of Claim 59, further comprising instructions that cause the processor to:

calculate a variance value of the portion of the video frame to generate the texture information;

compare the calculated variance value of the portion of the video frame to an average variance value of at least one other video frame; and

if the variance value of the portion is less than the average variance value of the at least one other video frame, categorize the portion as nonpredictive.

61. (Previously Presented) The processor-readable storage medium of Claim 59, wherein motion information comprises pixel differences between the portion of the video frame and at least a portion of at least one other video frame.

62. (Currently amended) A processor-readable storage medium comprising instructions that when executed by a processor cause the processor to:

receive a configuration signal; and

configure at least one variable within a complexity control algorithm in accordance with the configuration signal,

wherein based on the complexity control algorithm, a processor executing the algorithm:

determines whether texture information of the portions indicates there is less than or equal to a predetermined amount of spatial information;

categorizes portions of a predictive video frame as nonpredictive portions based on the determination when texture information of the portions indicates there is less than or equal to a predetermined amount of spatial information, in response to the determination and categorization, selectively performs motion estimation to generate motion information associated with the portion;

uses the motion information to determine whether to categorize the portions as predictive portions if the texture information of the portions indicates there is not less than or equal to the predetermined amount of spatial information, and configures ~~configuring~~ the at least one variable of the complexity control algorithm increases the number of portions in the predictive video frame characterized as nonpredictive portions based upon the texture information.

63. (Previously Presented) The processor-readable storage medium of Claim 62, wherein the configuration signal conveys one of image size information, transmission frame rate information, a user command, and information regarding available hardware resources.

64. (Previously Presented) The processor-readable storage medium of Claim 62, wherein instructions to cause the processor to configure at least one variable within a complexity control algorithm further comprise instructions that cause the processor to adjust the predetermined amount of spatial information.

65. (Previously Presented) The processor-readable storage medium of Claim 62, wherein receiving a configuration signal comprises receive a configuration signal that originates from a network.

66. (Previously Presented) The apparatus of Claim 26, wherein the means for using texture information:

determines a variance value of the current macroblock,
compares the variance value of the current macroblock to a scaled variance value of a macroblock from at least one other video frame, and
determines to nonpredictively encode the current macroblock if the variance value of the current macroblock is less than the scaled variance value of the macroblock from at least one other video frame.

67. (Previously Presented) The apparatus of Claim 26, wherein the means for using the motion information:

determines pixel differences between the current macroblock and a macroblock from another video frame; and

determines to predictively encode the current macroblock with fractional-pixel motion estimation if the pixel differences between the current macroblock and the macroblock from another video frame is less than a configurable threshold value.

68. (Previously Presented) The apparatus of Claim 26, wherein the means for using the motion information:

determines a sum of absolute distance values between the current macroblock and macroblocks from at least one other video frame; and

determines to predictively encode the current macroblock with fractional-pixel motion estimation if the sum of absolute distance values is less than a scaled average minimum sum of absolute distance values of macroblocks from at least one other video frame.